M145790

REV. 11

KEPCO ACCESSORY EQUIPMENT

PROGRAMMING CARD SN 488-D

Please record the equipment nameplate serial number in the space provided.

Model SN 488-D

Serial No. . . . . .

instruction manual

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DESCRIPTION

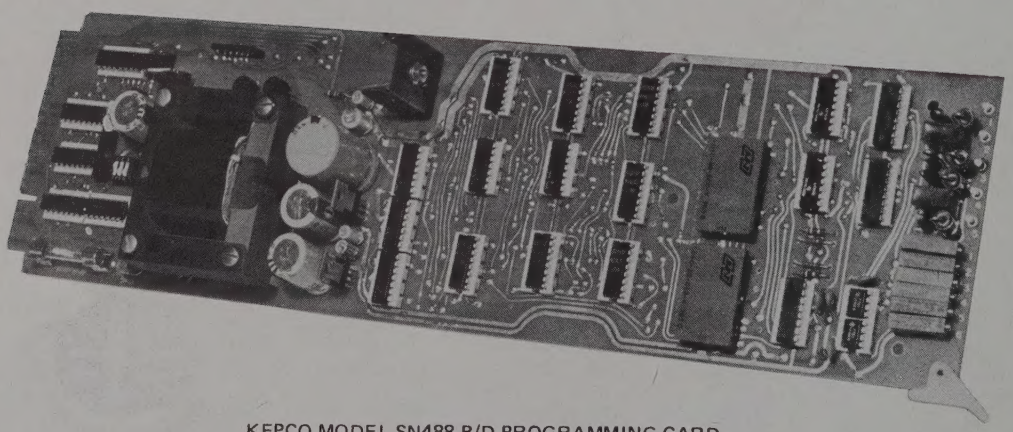
GENERAL

The Kepco Models SN 488-B and SN 488-D Programming cards are plug-in components for Kepco's IEEE 488 Digital Programming System. These Programming Cards are to be inserted into the card cages of the 488 System (Models SNR 488-4 and SNR 488-8) which hold up to four or up to eight cards respectively. Each PROGRAMMING CARD contains two electrically common, but indepenently addressable channels. Each channel performs the conversion of digital input commands to analog output signals.

This instruction manual contains a brief description, specifications, schematic diagram and parts documentation of the Kepco Model SN 488-B/D Programming Card. For System Operating Instructions and Theory of Operation, see Systems Manual for Models SNR 488-4/8.

SPECIFICATIONS

MODELS		SN 488-B	SN 488-D
INPUT CODING		BINARY	BCD
RESOLUTION		12 Bit	3 Digit
OUTPUT VOLTAGE	High Range	±10V	
	Low Range	±1V	
OUTPUT CURRENT		±2 mA max.	
OUTPUT IMPEDANCE		<0.05 ohms	
LINEARITY ERROR	0 to +70°C	±1/2 LSB	
TEMPERATURE COEFFICIENT	Full Scale	±35 PPM/°C max.	
	Zero High Range	±20 μV/°C max.	
	Zero Low Range	±10 μV/°C max.	
LOGIC INPUT		TTL COMPATIBLE	
DIGITAL INPUT FORMAT		BYTE SERIAL, BIT PARALLEL	
INTERFACE FUNCTIONS IMPLEMENTED		AH1, L1	
A-C INPUT	Voltage	105-125V/210-250V	
	Frequency	50-440 Hz	
	Power	≈12 VA	



KEPCO MODEL SN488-B/D PROGRAMMING CARD

INSTALLATION

Loosen the locking thumb screws on the SNR 488-4/8 RACK HOUSING. Slide the Programming Card into the designated slot, using the board-mounted thumb lever. Close RACK HOUSING cover and refasten the locking screws.

CODING

Digital input coding is either binary(Model SN488-B) or BCD (Model SN488-D).

INPUT/OUTPUT

Digital input commands are applied either from a suitable computer (controller) via the IEE488 data bus, or, manually, via the Kepco Model SN488-K keyboard. The analog output from each channel serves as the input to the systems programmable power supply.

ISOLATION

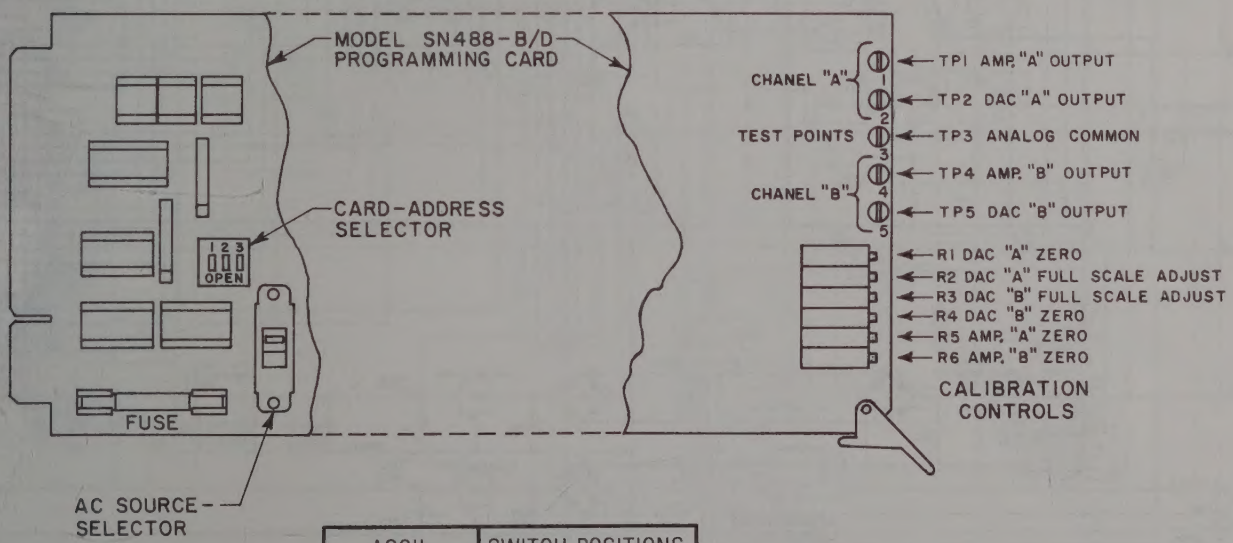
The two channels on each programming card are optically isolated (1000V d-c) between their digital input and their analog output.

CONTROL

Both channels can be digitally programmed for output magnitude, range (0-1 volt or 0-10 volt) and polarity (±).

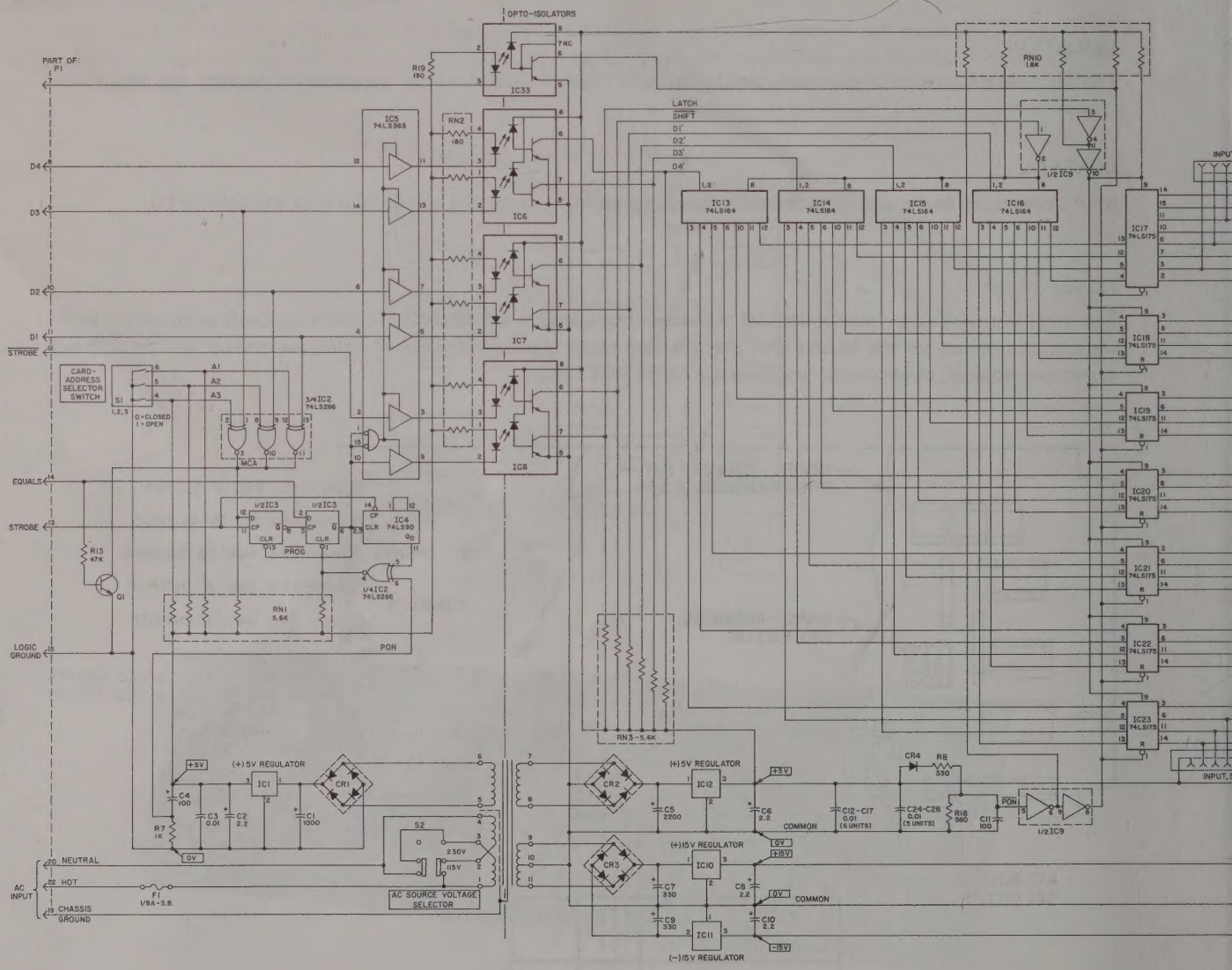
NOTE:

Operating instructions for the SN 488-4/8 System with the Models SN 488-B/D Programming Cards are provided in the instruction manuals for the Models SNR 488-4/8 Card Cages (Systems Manual). If additional manuals for the SNR-488 system are required, please contact your nearest Kepco Sales Office.



ASCII CHARACTER	SWITCH POSITIONS S1	S2	S3
0	0	0	0
1	1	0	0
2	0	1	0
3	1	1	0
4	0	0	1
5	1	0	1
6	0	1	1
7	1	1	1

AVAILABLE CARD ADDRESSES



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PATENT NOTICE: Applicable Patent Numbers will be supplied on request.

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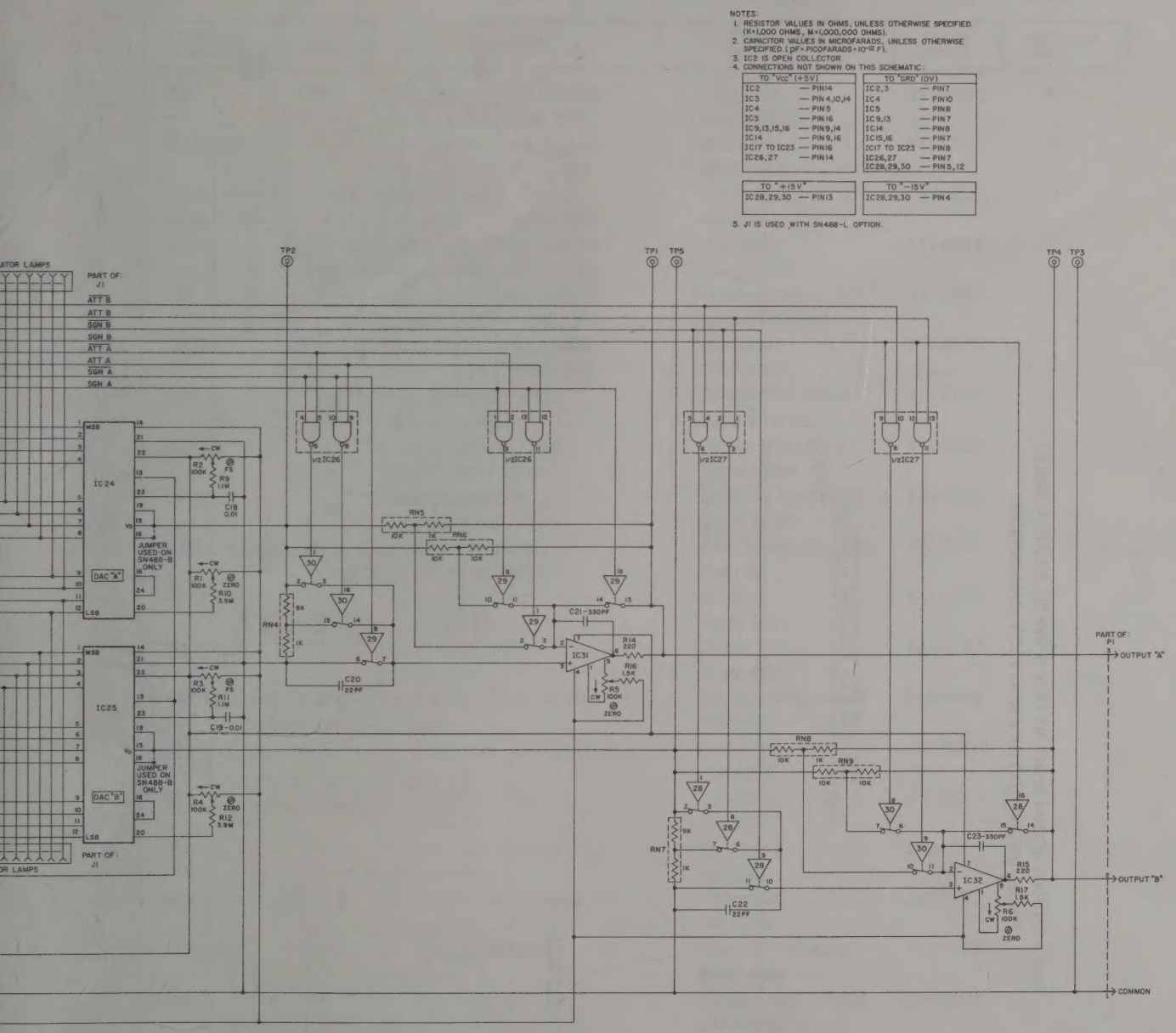
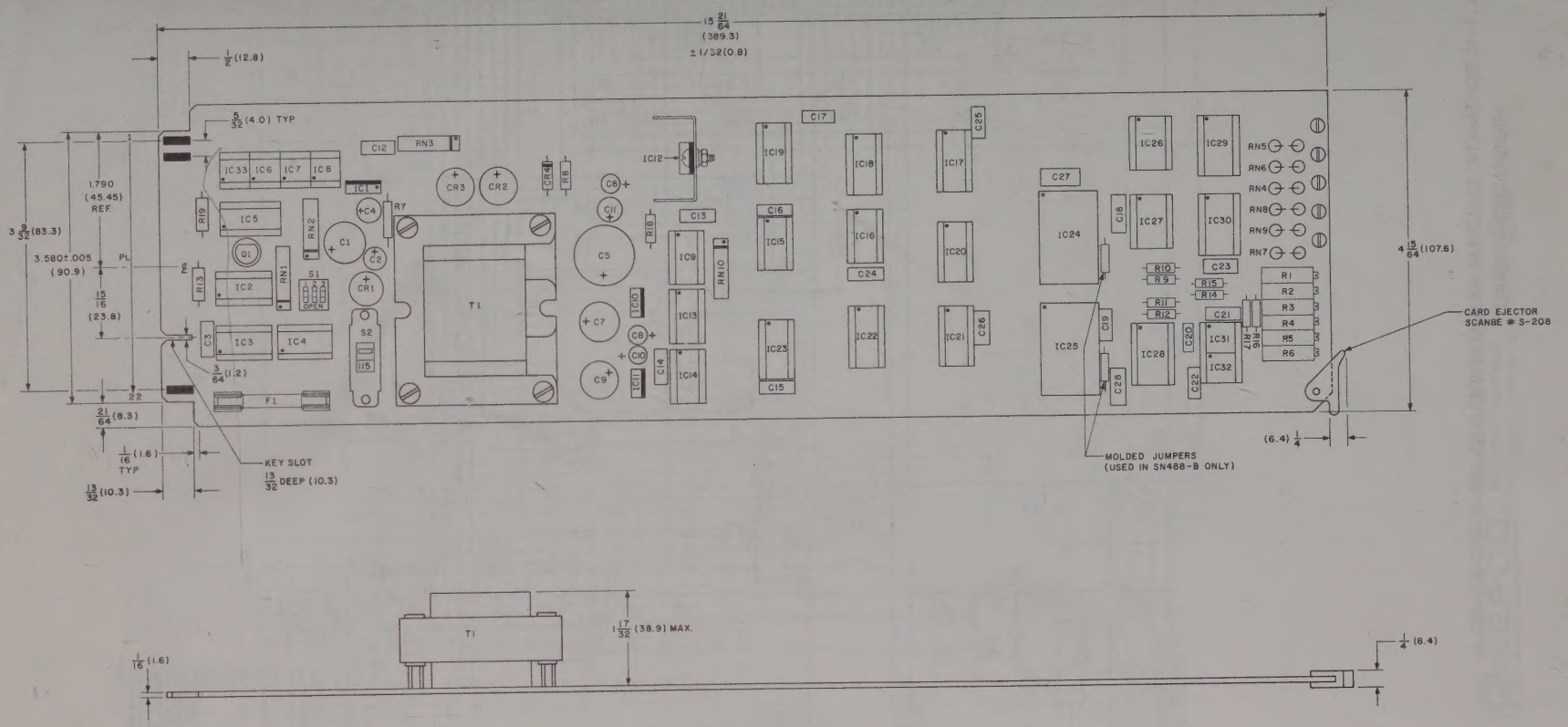


FIG. 5-10 SCHEMATIC DIAGRAM, KEPCO MODELS SN 488-B AND SN 488-D, PROGRAMMING CARD.



NOTES:
1. MATERIAL: 1/16 THICK G-10, 1 OZ COPPER DOUBLE SIDED BOARD.
2. DIMENSIONS IN PARENTHESSIS ARE IN MILLIMETERS.
3. ALL DIMENSIONS UNLESS INDICATED ARE ±1/64 (0.4).

COMPONENT LOCATION AND OUTLINE DRAWING,
KEPCO MODELS SN 488-B AND SN 488-D PROGRAMMING CARD.

KEPCO REPLACEMENT PARTS LIST

MODEL SN 488 B/D **PROGRAMMING BOARD ASSEMBLY (A1)** **Code 04-2285**

REFERENCE DESIGNATION	QTY.	DESCRIPTION	MFRS. NAME & PART NO. SEE BOTTOM NOTE	KEPCO PART NO.	REC. SPARE PART QTY.
C1	1	Cap., Elect., Rad. Leads 1KμF, +75 – 10%, 16V	Nichicon 16ULA1000	117-0876	1
C2,6,8,10	4	Cap., Elect., Rad. Leads 2.2μF, +75 – 10%, 50V	Nichicon 50ULA2.2	117-0878	1
C3,12 thru 19 24 thru 28	14	Cap., Ceramic, Disc. 0.01μF, +80 – 20%, 25V	Centralab CK-103	117-0860	1
C4,11	2	Cap., Elect., Rad. Leads 100μF, +75 – 10%, 6.3V	Nichicon 6.3ULA100	117-0875	1
C5	1	Cap., Elect., Rad. Leads 2.2KμF, +75 – 10%, 16V	Matsushita ECE-T16R2200S	117-0877	1
C7,9	2	Cap., Elect., Rad. Leads 330μF, +75 – 10%, 35V	Nichicon 35ULA330	117-0879	1
C20,22	2	Cap., Ceramic, Dic. 22pF, 5%, 500V	Radio Mat. Corp. Type UN750	117-0893	1
C21,23	2	Cap., Ceramic, Disc. 330pF, 10%, 500V	Radio Mat. Corp. Type B-HD	117-0556	1
CR1,2,3	3	Rectifier, Bridge 200V (PIV), 1A	General Instruments Type W-02	124-0346	1
CR4	1	Diode, Switching 75V (PIV), 400mW	AM. Power Devices IN4148	124-0437	1
F1 (115V)	1	Fuse. Slow Blow 0.125A, 115V	Buss Type MDL	141-0026	5
F1 (230V)	1	Fuse, Slow Blow 0.06A, 230V	Buss Type MDL	141-0021	5
IC1,12	2	IC, 3-term. (+) Volt. Reg. TO-220	Texas Instruments 78M05	250-0062	1
IC2	1	IC, Quad. Ex. Nor (Open Coll.) 14 pin, DIP	Fairchild 74LS266	250-0060	1
IC3	1	IC, Dual Flip-Flop 14 pin, DIP	Fairchild 74LS74	250-0071	1
IC4	1	IC, Decade Counter 14 pin, DIP	Fairchild 74LS90	250-0081	1
IC5	1	IC, Hex-Buffer, 3-state 16 pin, DIP	Fairchild 74LS365	250-0072	1
IC6,7,8	3	IC, Optical Isolator 8 pin, DIP	Hewlett-Packard 5082-4355	119-0125	1
IC9	1	IC, Hex Inverter 14 pin, DIP, (Open Coll.)	Texas Instruments SN7405S	250-0034	1
IC10	1	IC, 3-term. (+) Volt. Reg. TO-220	Fairchild 78M15	250-0064	1
IC11	1	IC, 3-term. (–) Volt. Reg. TO-220	Fairchild 79M15	250-0065	1
IC13,14,15,16	4	IC, 8-bit Shift Register 14 pin, DIP	Fairchild 74LS164	250-0066	1
IC17 thru 23	7	IC, Quad D Flip-Flop 16 pin, DIP	Fairchild 74LS175	250-0067	1
IC24,25 (SN 488-B)	2	IC, D/A Converter 12 bit Binary	Burr-Brown DAC-80-CB1	250-0078	1

NOTE: REPLACEMENT PARTS MAY BE ORDERED FROM KEPCO, INC. ORDERS SHOULD INCLUDE KEPCO PART NUMBER AND DESCRIPTION.

PLEASE NOTE: THE MANUFACTURER'S NAME AND PART NUMBER LISTED FOR EACH ITEM ON REPLACEMENT PARTS LISTS REPRESENTS AT LEAST ONE SOURCE FOR THAT ITEM AND IS LISTED SOLELY FOR THE CONVENIENCE OF KEPCO EQUIPMENT OWNERS IN OBTAINING REPLACEMENT PARTS LOCALLY. WE RESERVE THE RIGHT TO USE EQUIVALENT ITEMS FROM ALTERNATE SOURCES. KEPCO, INC.

KEPCO REPLACEMENT PARTS LIST

MODEL SN 488 B/D **PROGRAMMING BOARD ASSEMBLY (A1)** **Code 04-2285A**

REFERENCE DESIGNATION	QTY.	DESCRIPTION	MFRS. NAME & PART NO. SEE BOTTOM NOTE	KEPCO PART NO.	REC. SPARE PART QTY.
IC24,25 (SN 488-D)	2	IC, D/A Converter 3-BCD	Burr-Brown DAC-80-CCD	250-0077	1
IC26,27	2	IC, Quad 2-input NAND 14 pin, DIP	Fairchild 74LS00	250-0053	1
IC28,29,30	3	IC, Analog Switch 16 pin, DIP	National LF13201	250-0082	1
IC31,32	2	IC, Fet input op-amp. 8 pin, DIP	Texas Instruments TI-L081	250-0100	1
IC33	1	IC, Optical Isolator 8 pin, DIP	Hewlett-Packard 6N136	119-0140	1
Q1	1	Transistor, Si, NPN Small Signal	Fairchild 2N3566	119-0081	1
R1 thru 6	6	Res., Variable, Trimmer 100K ohm, 10%, ¼W	Bourns Type 3009P	115-2399	1
R7	1	Res., Fxd., Molded 1K ohm, 10%, ¼W	Allen Bradley CB1021	115-2238	1
R8	1	Res., Fxd., Molded 330 ohm, 10%, ¼W	Allen Bradley CB3311	115-2233	1
R9,11	2	Res., Fxd., Molded 1.1M ohm, 5%, ¼W	Allen Bradley CB1055	115-2657	1
R10,12	2	Res., Fxd., Molded 3.9M ohm, 5%, ¼W	Allen Bradley CB3955	115-2634	1
R13	1	Res., Fxd., Molded 47K ohm, 10%, ¼W	Allen Bradley CB4735	115-2237	1
R14,15	2	Res., Fxd., Molded 220 ohm, 10%, ¼W	Allen Bradley CB2211	115-2227	1
R16,17	2	Res., Fxd., Molded 1.5K ohm, 10%, ¼W	Allen Bradley CB1521	115-2229	1
R18	1	Res., Fxd., Molded 560 ohm, 10%, ¼W	Allen Bradley CB5611	115-2210	1
R19	1	Res., Fxd., Molded 180 ohm, 10%, ¼W	Allen Bradley CB1811	115-2385	1
RN1,3	2	Res., Network 5.6K ohm, 5%, (7 units) 1W total	Capar CRN8/75.6KJ	234-0004	1
RN2	1	Res., Network 180 ohm, 5%, (7 units) 1W total	Capar CRN8/7180J	234-0003	1
RN4,7	2	Rest., Network 1KΩ/9KΩ, 0.01%, match, 0.1W	Dale SPTF-ARO-3	234-0008	1
RN5,8	2	Res., Network 1KΩ/10KΩ, 0.01%, match, 0.1W	Dale SPTF-ARO-2	234-0007	1
RN6,9	2	Res., Network 10KΩ/10KΩ, 0.01%, match, 0.1W	Dale SPTF-ARO-1	234-0006	1
RN10	1	Res., Network 1.8K ohm, 2%, (5 units) 0.55W	Dale MSP06A01-182G	234-0024	1
T1	1	Transformer, Power	Kepco Inc. 100-2187	100-2187	1
S1	1	Switch, Min. Rocker 3PST DIP	Grayhill 76B03	127-0331	0
S2	1	Switch, Slide DPDT	Switchcraft 46206LFH	127-0294	0

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